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The Sacred Dimension of Protected Areas

Proceedings of the Second Workshop of the Delos Initiative - Ouranoupoiis 2007

Edited by Thymio Papayannis and Josep-Maria Mallarach

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Landscape conservation actions on Mount Athos

Athos Peninsula, Halkidiki, Central Macedonia, Greece

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Abstract

The Athos Peninsula / Holy Mountain is a mountainous landscape characterised by diverse vegetation and a complex topography whose profound beauty and diversity is preserved by an orthodox monastic community whose history goes back over 1,000 years. The Holy Mountain is a World Heritage Site.

The need for special landscape conservation actions emerged after the wildfire of 1990 and the road network that has since been developed. The Holy Community and the monasteries launched several landscape conservation initiatives aimed at restoring the forest and assessing the impact of infrastructural development on the environment and overall ecological management of the area. The first such study concerned the ecological management of the Simonopetra area and the management plans for the forest of each monastery. An important step towards assessing the impact of the forest road network and the requisite restoration work was the study on the 'Rehabilitation of slopes along the forest road network in Mount Athos'.

The next important step towards rehabilitating the landscape was the spiritual and economic support from the Holy Community provided for Professor Dafis' call for the gradual abandonment of the coppice management of oak forests (Holm oak and Hungarian oak). This was implemented through the Life-Nature project 'Rehabilitation of coppice *Quercus frainetto* woods and *Quercus ilex* woods', which aimed to invert coppice into high forests.

< The Holy Monastery of Agios Pavlos, Mount Athos, Greece

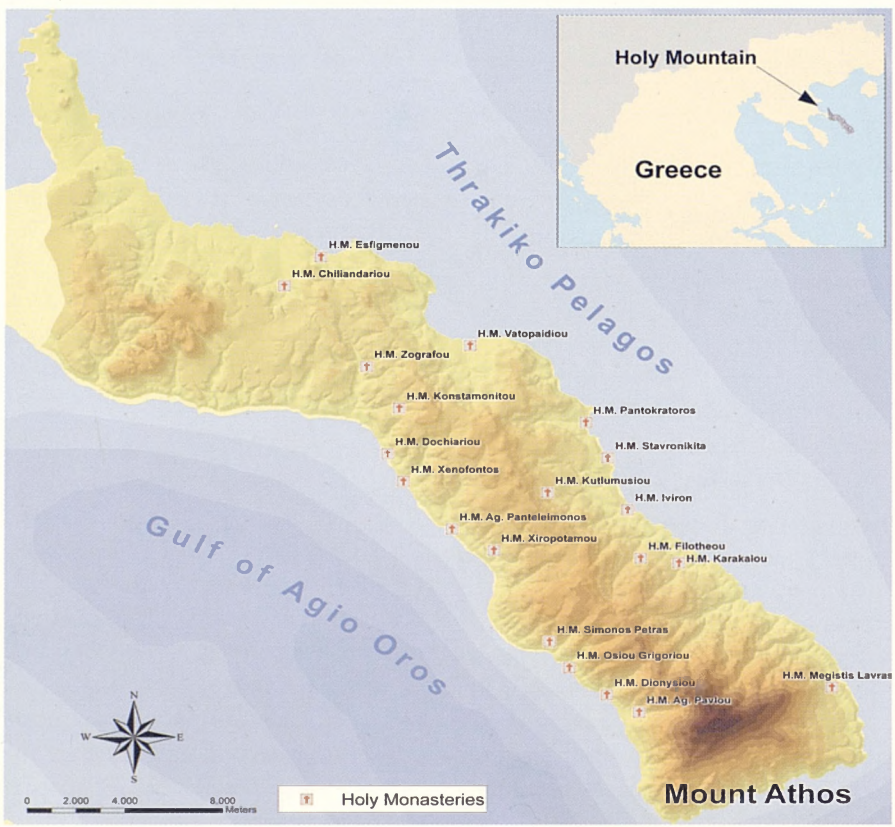
Introduction

Mount Athos and its 20 monasteries has stood proud down the centuries, a lofty symbol on the Athos Peninsula denoting the Ark of Orthodoxy and Faith, a guardian of the history and cultural heritage of the land that cherishes a priceless part of society's natural riches with such devotion.

The blue sea and gentle coastline, the wild beauty of the ravines and cliffs and the dense green vegetation alongside the monasteries and sketes that seem to hover in mid-air compose a representative picture of the timeless and close-knit relationship between Man and Nature.

This is a landscape of rare beauty and major ecological significance, exquisite architectural achievements and outstanding historical and religious value. When, during the 20th century, this unique landscape suffered a widespread degradation of its natural qualities for the first time, the monastic community responded with several initia-

Mount Athos is the highest peak on the peninsula of the same name, which forms the easternmost part of Halkidiki in North-eastern Greece



tives which sought to reduce the adverse impact of road network projects, to enhance the ecological management of the forests, and to supervise the coppice oak forests.

The natural setting

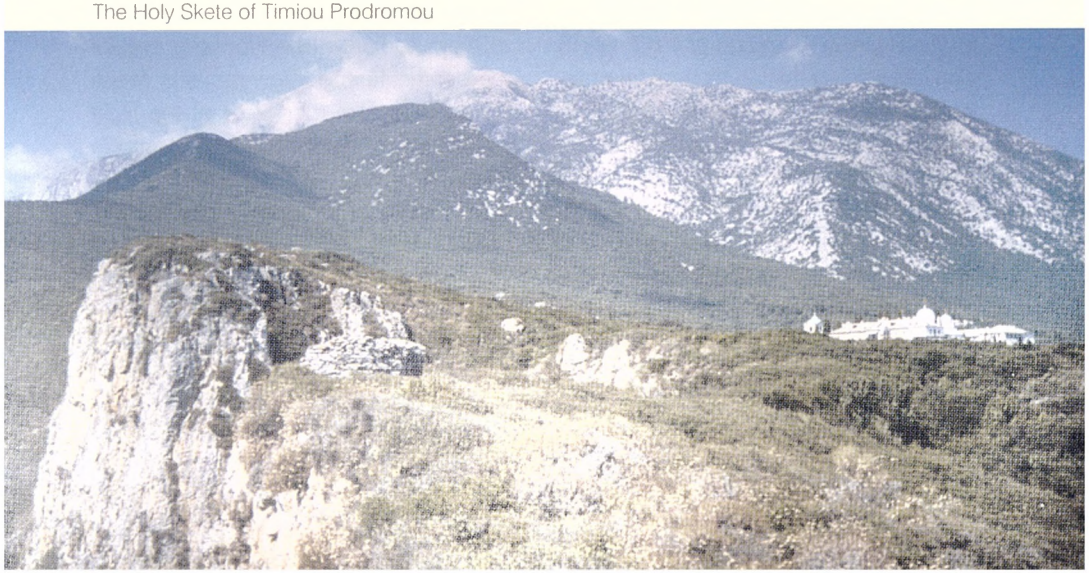
Mount Athos is the higher peak of the peninsula of the same name and forms the easternmost part of Halkidiki in North-eastern Greece (image in p. 128). Mount Athos is also known as the 'Athos Peninsula', the 'Holy Mountain' or –more simple– the 'Mountain' (Oros), a term used mainly by people in Halkidiki and other nearby areas. Geologically, Mount Athos is an extension of the Rhodope mountain range and consists of metamorphic rocks –gneiss, greenstone, schist and limestone– with a high mineral and structural diversity.

Apart from its great geological diversity, Mount Athos has a complex topography dominated by its peak which soars to 2,033 metres. The climate of the peninsula is affected by the North-westerly winds and the mountain itself, which acts as a major windbreak, creating a unique micro-climate.

This geological diversity and topographic complexity combined with climatic variety, the isolation of the narrow peninsula and the absence of grazing has resulted in a complex mosaic of several vegetation types ranging from characteristic Mediterranean to alpine habitat types. Apart from the diversity of habitat types, the area is also characterised by good to excellent conservation status and considerable species diversity comprising 1,453 plant taxa (Babalonas 2001) as well as 131 bird, 37 mammal, 14 reptile and eight amphibians species (Vavalekas 2001).

The rich vegetation and complex topography of Mount Athos make for a profoundly beautiful and diverse landscape. Soft coastal landscapes can be found adjacent to deep gorges and alternate with steep coastal rocks. The natural environment is an integral part of the cul-

The Holy Skete of Timiou Prodromou



Mixed beech / fir forest on Mount Athos

tural heritage of Mount Athos, which should be protected with special care (images in pp. 129 and 130).

Historical data

Grisebach (1841) reports that Mount Athos was surrounded by thick old-growth forests with a great variety of species and vegetation. The same author states that the natural characteristics of the area were unique and could not be found elsewhere in Europe. However, after the Russian revolution of 1917, which was followed by the Greek rural reformation in the 1920s, the monasteries began exploiting their forests in order to make up for the revenues lost from expropriated properties and from donations from the Orthodox communities of Russia. As a result, the majority of the forests were turned into coppice.

Rauh, who visited the Holy Mountain in the 1940s, argued that the vegetation had maintained the abundance and plenitude reported by Grisebach despite the conversion of many forests to coppice, and that it constituted an oasis in the Balkan Peninsula whose remaining forests were poor at best. Nevertheless, the available data are poor and it is possible that the transformation led to the loss of flora and fauna species which only live in old-growth forests.

Nowadays, the only high forests on Mount Athos are some beech (*Fagus sp.*) and mountainous Mediterranean conifer forests (Black pine), the forests of Aleppo pine in the Northern part of the peninsula and a few remains of the mixed forests in the forest of the Holy Monastery of Grigoriou and in remote locations of the forests of the monasteries of Simonopetra and Megisti Lavra.

The ecosystems of the broadleaved evergreen trees, which provided the monasteries with fuel wood, were also severely impacted as fuel wood and charcoal remain an almost exclusive source

of energy for many monasteries and sketes to this day. As a result, the mountain's evergreen deciduous formations show various levels of degradation around almost all of its monasteries.

Nature and monastic life

Orthodox monastic life is characterised by temperance, the careful use of natural resources and a sensitivity towards nature conservation. The ultimate criteria for the use of natural resources are symmetry between needs and use, and the preservation of spiritual peace. The limits of monastic life should serve the conservation of nature, and there are written rules dating back to the foundation of the monastic community of Mount Athos, which explicitly prohibit actions with the potential to alter the balance of nature.

Forest management is no exception. During the reign of the Byzantine emperor Ioannis Tzimiskis (AD 972), limitations were placed on the timber trade (Box 1), while later legislation specified that the forests could only be exploited to cover the needs of the monasteries.

Today, monks follow in the monastic tradition of 'order' and 'sustainability' and try to live in harmony with their environmental surroundings, to manage the forests with respect, care and a love for nature, and to apply the traditional monastic knowledge in parallel with modern scientific methods and techniques.

Landscape conservation actions

Reducing the impact of the road network

In August (14-18) 1990, a devastating fire destroyed 2,230 ha of mainly chestnut and oak forests and threatened the Monastery of Simonopetra. The fire was able to spread so widely for two main reasons: the absence of forest roads and the density of the coppice forests (Kailidis 1990). After this tragic incident, the Monastic Community realised that further action was required for the sound management of Athos' forests and landscapes, and that:

- Coppice management should be re-evaluated.
- New road networks should be constructed for the protection of the monasteries and forests.

Many new roads were constructed as a result over the next few years. However, because the monks' fearful state of mind

Box 1

Ioannis Tsimiskes' Typikon [Rules of governance of the monastic community] of AD 972 imposed strict limits on the trade in forest products, while a second Typikon issued by Constantine VII Monomachos in AD 1045 states that trees may only be felled to provide for the needs of the monasteries.

Forest road constructed in the early Nineties visible from the sea

was not conducive to careful planning, this development left permanent scars on the Athonite landscape (image in p. 132). When the monks became aware of the problem, they decided to investigate methods for rehabilitating slopes along their forest road network, resulting in a Special Environmental Management Study conducted by the Greek Biotope / Wetland Centre (Dafis *et al.* 1999). The main two objectives of this Study were:

- To assess the impact of the construction of the road network on nearby natural landscapes; and
- To evaluate potential restoration measures.

The report concluded that for 11 of the 20 monasteries, the road density was higher than the 15m/ha limit considered appropriate for the environment. After almost ten years, it is clear that the Athonite road network has to be thoroughly studied as a whole. It is also clear that this study should consider the closure of some roads and their return to a natural state. New roads should only be opened after adequate deliberation and a careful environmental assessment into the appropriate drainage works and restoration measures. Regarding the rehabilitation of the roads, the study of 1999 concluded that natural vegetation had successfully established itself on all low height (3-5m) slopes, but that intervention was necessary for, and restoration measures should applied to, slopes higher than 5 metres.

Finally, it was suggested that mature trees should not be removed, even if they are in close proximity to the road network, whereas further reforestation plans (involving mainly local species) should be drawn up and implemented. Subsequently, all new roads (image in p. 133) have been implemented in line with these simple rules and the results are more than obvious, as can be seen from a comparison of images in pp. 132 and 133.

Newly-constructed road in which care has been taken to minimise the impact on the landscape

Ecological management of the forest of Simonopetra Monastery

The fire of 1990 adversely affected the lands of the Simonopetra Monastery, whose monks decided that the forest should be managed ecologically to produce wood to cover the monastery's needs and to render it better prepared in the event of another forest fire. Accordingly, the monks invited Professor Spyros Dafis and his team to produce a detailed inventory of the monastery's natural environment and to make proposals concerning the ecological management of their forest. In addition to these main objectives, the study also assessed the situation after the forest fire of 1990.

The study (Dafis 1993) covered an area of 1260 ha and identified 14 fundamental points relating to the ecological management of the monastery's forests, such as favouring mixed stands, increase the minimum diameter of logged trees, conserving aged trees, introducing ecologically-tolerable methods of transportation and setting some stands aside as nature reserves. With regard to the rehabilitation of burned areas, the study proposed felling all burned trees for aesthetic reasons, protecting the soil, increasing its organic matter and the forest's inversion to high forest. The study also proposed the stratification of the burned trunks along the contours of the slopes to help prevent soil erosion.

These recommendations respected the integrity of the site and were followed to the letter. Today, 17 year on, it is very difficult to find evidence of the fire since the vegetation has fully recovered, Castanea woods are now coppiced every 35-40 years, and 29 ha (which equates to 23% of the forested area of the Simonopetra Monastery) have been excluded from exploitation and set aside for nature conservation. More importantly, most of the other monasteries proposed their own environmental management plans in the wake of the Simonopetra Monastery's in-

itiative; the 14 principles originally presented to the Simonopetra Monastery are now widely accepted across the Holy Mountain.

Inversion of coppice Hungarian oak and Holm oak woods to high forest

The coppice oak forests have been recognised since the fire of 1990 as a threat which could assist the spread of forest fires. At the same time, several monks responsible for forest management realised that Hungarian oak (*Quercus frainetto*) could provide high-quality timber for constructions, that coppice management had altered the pristine landscape of Mount Athos, and that several species typical of high forests had become rare due to the alteration of their habitat. At the same time, the income from Holm oak (*Quercus ilex*) forests had fallen in significance.

In this context, the Holy Community of Mount Athos implemented the LIFE-Nature 'Rehabilitation of coppice *Quercus frainetto* and *Quercus ilex* woods to high forest' project. The main scope of this project was to initiate the rehabilitation of coppice Holm oak and Hungarian oak woods to high forest[1].

The method selected for the rehabilitation of both types of oak forests was that of selective inversion thinning, which over the three-year period of the project was successfully applied to an area of 500 ha (Kakouros and Dafis 2004). Other key objectives of the project included the training of forest workers and supervisors, the establishing of a monitoring system consisting of 45 permanent test plots, and the publication (with contributions from associated Italian and Spanish networks) of *Guidelines for the Rehabilitation of Degraded Oak Forests* (Dafis and Kakouros 2006).

The main results of the project can be summarised as follows:

- Successful implementation of selective inversion thinning, especially in Holm oak, which will reduce the risk of wildfires and enhance diversity of species which prefer less dense forests.
- The setting up of a monitoring system allowing for a long-term ecological and economical assessment of the method; and
- The establishing of a demonstration area for the sustainable management of Holm oak and Hungarian oak forests in Greece and the Mediterranean in general.

One of the most important elements of the project was the close cooperation with the monks, the exchange of experience on forest management issues, and most importantly of all the integration of the spiritual aspects of nature management –the beliefs that the forest should be treated as a valuable and fragile gift from God; that forest management should take it into consideration that the forest should provide shelter for all God's creatures; and that wood and non-wood products of the forest should be extracted only to benefit the spiritual life of monks and pilgrims– into the planning and implementation of the project.

1 http://ec.europa.eu/environment/life/countries/ documents/greece_en_nov06.pdf

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